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VII. ARE THERE MENTAL INFERENCES IN DIRECT PERCEPTIONS?

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WHILE there is virtually a consensus among contemporary philosophers of perception that some form of direct realism is true, there is less than complete agreement about whether normal, direct perceptions involve mental inferences in any sense. In taking another look at this recurrent question, my aim is twofold: first, to examine some of the arguments and evidences that have been offered in favor of inferences and to see if they can be accommodated within the direct realist framework, and second, to attempt to clarify and defend the insight of direct realism that normal perceptions are noninferential.

Let us recall the two central claims of direct realism. First, as a form of realism it accepts from common sense the idea that the world includes among its constituents physical objects having sensible properties and existing unperceived. The second and distinctive thesis of direct realism is that perceiving organisms are capable of having direct or noninferential knowledge of these same physical objects and their sensible properties. In normal circumstances, someone's perceiving that there is a red book in front of him is a case of knowing that there is a red book in front of him. And what one perceives and has knowledge of in this case is the actual physical book in its physical surroundings.

But what exactly is meant when it is said that this knowledge is "direct" and "noninferential"? The answer given by direct realists has a positive and a negative side. On the one hand, they assert that our perceptual judgments *refer* to external physical things, and on the other hand, they deny that normally we make any additional judgments that refer to items other than physical things. In particular, it is denied that the immediate objects of perceptual experience are sense data or sense impressions on which we base our perceptual judgments about physical things. Hence the direct realist asserts that perceptual knowledge is *direct* and *noninferential* in the sense that it does not involve an inference from a prior knowledge and awareness of sensory items to the perceptual judgment about physical things.

There is a second sense in which it may be said that normal perceptions are *directly* of physical things, namely that it is physical things in their physical settings that are phenomenologically *present* in perception. Consider this remark from Romane Clark:

> Perceptions are directly of things and happenings in our physical surroundings. 'Directly' here means that however complicated the causal path may be from environment to perception, what we experience are items of our physical environment and not surrogates, or images, or intermediaries of them.[1]

In this passage, Clark seems to be making a phenomenological claim about what is present in our perceptual experience, or at least what he is saying depends on such a claim. And the claim can hardly be denied: it would be grossly inaccurate to describe what is present in our perceptual experience when we look at a large tree as a fleeting, mental sense datum, image, or appearance. What we take ourselves to be encountering in this experience is rather a very substantial part of the external world.

We should keep the distinction between these two senses of "direct" clearly in mind in order to guard against a possible fallacious argument against inferences. For it might be argued that since the things and happenings that we perceive

are uninferred in the sense that they are *present* in experience, then the corresponding perceptual judgments must likewise be uninferred from any antecedent judgments. But this would be a mistake for it is perfectly possible to maintain both that ordinary perceptual judgments are conclusions of inferences, and that the things intended by these culminating judgments are what is finally perceived and present in the experience. In the remainder of this paper, we will be concerned mainly with whether normal perceptual judgments are products of inferential reasoning from antecedent judgments.

What is an inference? and why should anyone think that the term can be applied to the mental activity that occurs in perception? The primary use of the term occurs in the context of forensics. We make inferences when we move in thought from a premise to a conclusion, taking the premise to be a reason or evidence for our conclusion. A further implication of the common meaning of *making an inference*—one which is often overlooked by philosophers—is that the subject must in some sense be *aware of* the premise which is the basis of his inference. Anthony Quinton makes a closely related point about inferences in perception:

> If [an inferential theory of perception] is correct two conditions must be satisfied. Statements about experience must count as reasons or evidence for statements about objects and they must in some, no doubt rather obscure, sense be accepted by those who make statements about objects.... A fact cannot be a man's reason or evidence for an assertion unless, however implicitly, he is aware of it.[2]

This primary use of "inference" will guide us in our investigation of perceptual inferences. If ordinary perceptual judgments are the result of inference, then the following conditions must be met: 1) whatever plays the role of premise in the inference must be a state which occurs prior to the perceptual judgment; 2) the subject must in some way be aware of this state. We may note immediately that the second condition assures that whatever functions as a premise must be an item of *experience*, and not a physiological occurrence in the eye or brain.

I. Common Sense and Inference

We do not usually think of peceptions as inferential. Rather we are accustomed to think that we make inferences from the things that are present in perception to things that are not present. For example, when I claim to see from the swelling on my daughter's arm that she has a mosquito bite, common sense would be ready to admit that I had made an inference, though not a conscious one, from what I do perceive, the swelling, to what I do not perceive, that the swelling was caused by a mosquito. If I find out that my perceptual belief was mistaken and that what I actually perceived was a pimple and not a mosquito bite, then I might say that I had wrongly *inferred* that the swelling on her arm was caused by a mosquito. But common sense would *not* admit that perceptions of ordinary objects such as arms and swellings involve inferences. The reason for this seems to be simply that these objects are present in our experience, and as such are not inferred. Admittedly there is no sharp line separating what is present and what is not present in experience. But ordinary objects such as arms and swellings can be inferred only if there is something more basic that is perceived from which the inference can be made, and common sense does not recognize any such things.

A further point that this case brings to light is that common sense willingly speaks of an inference even though there is no conscious process of inferring. I judge immediately that what I perceive is a mosquito bite. I am not aware of any inferential step by which I pass from an awareness of the swelling to a conclusion about its cause. This enables us to see that the absence of any conscious process of inferring is not a criterion for the absence of any inferring at all. Indeed if it were, then it would have to be allowed that even judgments about the pathways of subatomic particles and about other people's feelings and thoughts are not mediated by inference, since

these judgments need not involve any conscious reasoning. But we certainly do not want to go this far in disallowing inferences.

Let us now turn our attention to some of the reasons for thinking that perceptions are, after all, conclusions of inferences, and that the verdict of common sense must be reversed. We will deal first with an argument proposed by Gilbert Harmon based on a certain understanding of perceptual knowledge; next we will consider the implications of the attempts of cognitive psychologists to explain perceptual illusions; and finally we will examine the implications of the idea, accepted by direct realism, that perceptions are mediated by sense impressions.

II. If Perception is Knowledge, are there Inferences?

If perceptions are instances of knowing, then the judgments (and beliefs) included in them must be justified, and it is reasonable to think that ordinary perceptual beliefs are not self-justifying, but are justified through other beliefs. Gilbert Harmon, in his recent book *Thought*, has argued that it is necesary to invoke inferences from perceptual evidence in order to explain both ordinary direct perceptions as well as "Gettier examples involving direct perceptual knowledge."[3] These Gettier examples are "easily accounted for" if we suppose that direct perceptual knowledge is based on inference, but not otherwise. One of the examples discussed is as follows:

> A man looks and comes to believe that there is a candle directly before him. There is a candle there; but a mirror intervenes to show the reflection of a candle actually off to one side. The man's belief is justified and true; but he does not know. If his belief is the result of inference, his failure to know is easy to understand. Since inference attempts to find the best total exaplanatory account, he infers an explanation of the way things look. He infers that it looks to him as if there were a candle before him because there is a candle there and because of the normal connection between the way things look and the way things are. Since that explanation is essential to his conclusion but is false, he does not come to know that there is a candle before him even though his belief is justified and true.[4]

According to Harmon's explanation, the man is making this inference:

1) it looks as if there is a candle over there
2) normally, when things look a certain way it is because they are that way
3) present circumstances are normal
4) so, it looks as if there is a candle over there because there is a candle over there.

It should be noted that the conclusion of the man's inference involves a claim about the *cause* of his perceptual experience. Harmon is certainly correct in saying that what the man concludes is not simply that there is a candle in front of him, but also that there is an unbroken causal connection between the candle and his perceptual state. Consequently, what the man believes about the perceptual object is not entirely true, and therefore cannot be an instance of knowing.

And yet we may still wonder whether it is necessary to postulate an inference in this case. The perceptual evidence that is leading our man astray is his mistaken belief that perceptual conditions are normal. *We* know that conditions are not normal, and so *we* are in a position to see that his perceptual belief about the object and its relation to him rests on a mistaken belief. But even if the man's perceptual belief (so far as he knows) is supported by his belief that conditions are normal, it is not clear that this latter belief is the premise of an inference. It should be noted that our man's belief that conditions are normal is itself a complex perceptual belief which has its own justifying evidence. But is it plausible to think that when the man looks at what is before him, he *first* judges that conditions are normal, and *then* judges that a candle is there? It is far more probable that when his senses are appropriately stimulated, the belief that conditions are normal arises *concurrently* with the belief that the candle is there. And if this is so, then the former belief cannot serve as the premise of an inference. Our examination of this case shows that one can have and give evidence for one's perceptual belief without its being true that one has used this evidence in a process of in-

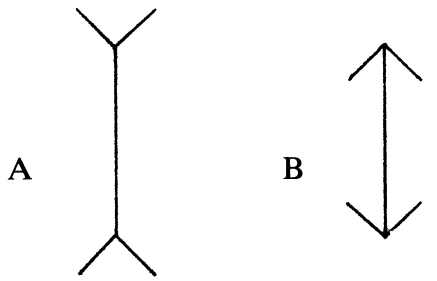
ference. Similarly, one can have reasons for judging that a particular act of killing is wrong without having arrived at this judgment by a process of reasoning.

There is, however, another deeper issue raised by Harmon's inferential theory, namely whether direct perception should be understood on the model of inferences to the best total explanation of one's sense experience. For we can agree that sense experiences do occur before the perceptual belief. We will deal with this important issue in a later section of this paper.

III. Cognitive Psychology and Unconscious Inference

Do the explanations of normal perceptions given by cognitive psychologists give evidence for unconscious inferences? We will attempt to answer this question by considering a case of perceptual illusion, for we have learned from perceptual psychology that the very same mechanisms that determine normal perceptions also produce the illusions.

Consider the familiar Muller-Lyer illusion figures in which the vertical axial lines A and B, though objectively equal, appear unequal.



The perceptual psychologist, R. L. Gregory, has given a plausible explanation of this illusion in terms of perspective-depth cues suggested by the line configurations which elicit the mechanism of size-constancy scaling.[5] The figures are perceived as simple perspective drawings suggesting depth. The lines going out from A are (unconsciously) seen as coming toward the perceiver, as when the corner of a room is viewed; the lines going toward B are seen as going away from the perceiver, as when the near corner of a building is viewed. A is then perceived as more distant than B on the basis of these distance cues, and consequently A is enlarged due to a "perceptual compensation" which holds the size of objects nearly constant despite variations in their perceived distance. It is, then, the perceived depth of A in comparison with B which is responsible for the enlargement of A.

What are the implications of this account for inferences? Let us suppose that the relevant content of the perceptual judgment in this case is that the vertical line A is larger in size than the corresponding line B. It is reasonable to interpret Gregory as saying that this perceptual judgment is the result of a mistaken inference from an antecedent sense experience of *equal* lines. We can reconstruct the pattern of this unconscious inference as follows:

1) it looks as if lines A and B are equal
2) it looks as if A is more distant than B
3) if two objects have the same apparent size, but one appears more distant, then the more distant object is larger
4) so, A is larger than B.[6]

The main argument in favor of this inferential hypothesis is that it seems to be implicit in the given psychological explanation of the illusion. After all, the thrust of that explanation is that the perceiver is engaged in a process of size-scaling, that is, enlarging one line and diminishing the other, and that this revision is the result of a perceived variation in distance. Gregory acknowledges that the factor of distance or depth is not finally "seen," it is only "indicated" by the lines. But he also shows that the lines *can* be seen as varying in distance in special circumstances in which they are viewed as luminous figures against an invisible background, and moreover that the perceived distortions in size are "very highly correlated" with this apparent depth.[7] It is difficult to avoid the conclusion that when one views the illusion, one is somehow taking account of depth at a deeper level of perception. The inferential hypothesis, then, seems to be correct, in saying

that the subject moves by an unconscious inference from a primary experience of equal lines that look as if they vary in distance to the perceptual conclusion that the lines are unequal.

But we should query whether this account is correct in identifying this primary experience of equal lines with a *sensation*. For suddenly it dawns on us that the experience has all the characteristics of a *perceptual* state. It involves an intentional reference to things outside the perceiver, viz. lines that are spatially related. The experience is an elementary taking, and as such lacks the character of givenness that has traditionally been ascribed to sensations. Thus it seems we must modify the inferential account we have given to say tht the subject makes a calculation based upon a prior minimal *perception* of equal lines varying in distance.

What can be said about our *awareness* of underlying perceptions of this sort? We have laid it down as a condition of making an inference that the subject must be implicitly aware of the premises of his inference. Since we are not *consciously* aware of the depth-perspective cues in the Muller-Lyer figures, then our modified inferential account must hold that we are *unconsciously* aware of these factors, where this means not only that we are experiencing them but that we have some idea or conceptualization of what we are experiencing.

There are several considerations which make it plausible to think that the minimal perceptions we have described are awarenesses. First, we should note that it is common to speak of unconscious awarenesses in other contexts such as Freudian psychology with its acceptance of unconscious desires and beliefs, as well as recent theories of language that explain linguistic competence in terms of the unconscious knowledge and application of a system of rules. Second, in viewing the premises of our inferences as *perceptual* states, in which the subject makes an intentional reference to external objects, we make them suitable candidates for awarenesses. And finally, the fact that the subject can become consciously aware of the perspective cues in the drawings, and in some cases can even cancel their effect and come to see the lines as equal, suggests that he was visually aware of equal lines even before he gained an understanding of the illusion.

The instance of perceptual illusion that we have examined has implications for normal perception. For it is reasonable to suppose that other instances of size-constancy scaling that result in veridical perceptions also involve mental inferences. While the conclusions of these inferences are not direct perceptions in the sense of being uninferred, nevertheless since they are inferred from minimal direct perceptions and not sensations, then the inferential theory we have defended is not in conflict with the central thesis of direct realism—that normal perceptions are not inferred from sensory states. Finally, we allow that our inferences culminate in *visual* experiences, and that what is inferred is directly perceived in the sense that it is present in the subject's experience.

IV. Are Sense Impressions Premises of Inferences?

If all perceptions are mediated by antecedent sense impressions, then it may be that we are aware of these sense impressions and pass from them by an inference to our perceptual conclusions. While direct realists generally agree that there are sense impressions, they do not agree about how to characterize them or about their role in perception. We will begin our discussion by giving a constructive account of sense impressions which draws heavily on the theory put forward in recent years by Wilfrid Sellars.[8] We will then go on to consider whether sense impressions can figure in perceptual inferences.

Since, according to direct realism, our perceptual judgments refer to physical objects and their properties, and since it is these physical objects that are present in the perceptual experience, then sense impressions are not the immediate objects of perceptual awareness. They are not rival objects of perception. We must *postulate* sense impressions to explain certain features of perception, which means that they are inferred entities in yet

another sense of this slippery word.

We theorize that sense impressions are mental occurrences that intervene between the physical stimulus and the final perceptual awareness. As such, we may expect that sense impressions have properties that link them to their physical stimulations, but also properties that provide the "raw material" for their consequent, full-blown perceptions. To account for our awareness of perceptible objects, we attribute to the sensory state properties which correspond to, but are not identical with, their sensible properties.[9] When holding a ball in one's hand in normal conditions, and perceiving by touch that it is a ball, one has a sense impression of something 'spherical', 'hard', and 'smooth' (where the single quotes indicate the unique predicates that designate properties of sensory states).

Accordingly, the perceptual process should be understood as having three separate stages, causally linked: the purely physical stimulus, which gives rise to the mental sense impression, which in turn gives rise to the "conceptually rich" perception. But it will not do to say simply that sense impressions causally mediate perceptual awarenesses, for they have a far more intimate connection with those awarenesses. We can only account for the sensuous, nonpropositional character of perceptual states, if we accept a strong form of the Kantian doctrine that the sensory "matter" is literally taken up into the perceptual experience and seamlessly united with it—although as we shall see in a moment it can be significantly altered in the process.[10]

What, then, must be added to this admittedly crude sketch of sense impressions in order to permit them to serve as premises of inferences? As we have seen, the subject must be aware of them in a sense which implies that he has formed some idea of them. Consequently, those philosophers who wish to say that perceptual judgments are inferences from sense impressions must hold either that sensing is itself a kind of knowing, or if it is not that we have direct knowledge of our sense impressions whenever they occur.

We may now take note of the fact that direct realists hold divergent views on this point. Wilfrid Sellars argues that sense impressions are "nonconceptual representations" that we are not normally aware of; Roderick Chisholm, on the other hand, holds that whenever we are sensing in some way we know that we are sensing in that way.[11] Since philosophers have always maintained the closest connection between being in a conceptual state, and being aware that one is in that state, then the question of inferences seems to boil down to whether or not we are always aware of how we are sensing.

Presumably, we are *sometimes* aware of how we are sensing in the (dispositional) sense that we can give noninferential reports about how we are sensing. I can know noninferentially that I am sensing 'intense heat', or that I am sensing something 'spherical', 'hard', and 'smooth'. But granting this, it is still highly doubtful that we are *always* aware of how we are sensing. My chief reason for saying this is that there seem to be many cases in which there are great discrepancies between what is sensed and what is perceived. In our earlier discussion of the Muller-Lyer illusion we found a disparity between the way the two lines appeared in conscious perception (as unequal in size), and the way they appeared at a more primary, but unconscious, level of perception (as equal in size, but varying in distance). We referred to the latter appearing as a minimal perception. We should expect to find even greater disparities between perceptions (minimal or maximal) and their underlying sensory stimulations.

Let us look at a case of such a discrepancy, one which will also help to clarify the idea that sense impressions are postulated occurrences. The psychologist, Grace Adams, related the following quaint but revealing personal experience:

> I was looking out of a window, watching for the streetcar, and I saw through the shrubs by the fence the brilliant red slats of the familiar truck; just patches of red, brilliant scarlet. As I looked, it occurred to me that what I was really seeing were dead leaves on a tree; instantly the scarlet changed to a dull chocolate brown.[12]

Adams then states that she tried to "recover the red" by imagining the streetcar, and found that she could "redden the leaves somewhat," but could not obtain the original scarlet. Nor could she recover entirely the later dull brown color. Finally, she reports, she went out to see what the actual color of the leaves was and found it to be a distinctly reddish brown color.

What should we say about Adams' sense experience as her perceptual experience changes from brilliant red to chocolate brown? Let us limit our discussion to the aspect of color. A possible view is that Adams is not sensing any colors that she does not perceive: she is not sensing brown at the time she perceives the red slats, nor is she sensing red at the time she perceives the brown leaves. One might take this line if one wished to avoid having to postulate sense experiences of which we are not consciously aware. But this is a highly implausible view. It seems rather that there must be some basis in the sense experience for these alternate perceptual states. Adams must be sensing reddish brown throughout the experience, though unconsciously, while perceptually judging and seeing, first, due to her strong expectation, that the red streetcar is behind the leaves, and second, that there are only dull brown leaves there.

What stands out in bold relief from this example is that our sense impressions are not always on the surface of, and discoverable in, conscious experience. Furthermore, this case is interesting because what is sensed is not merely supplemented in the perception, but positively revised and overruled. The reddish-brown sense experience is transformed into a brilliant red perceptual experience. In order to recover her original sense experience, Adams had to cast off her perceptual awareness that the brilliant red streetcar was there. Her final perceptual judgment that there were reddish-brown leaves before her was the perception that most faithfully reproduced her sense experience.

There are many illustrations in the textbooks of perceptual psychology of this kind of case in which there are large discrepancies between what is sensed and what is perceived. Indeed it may be said that the main task of the psychology of perception is to reveal the disparities between sensation and aspects of the commonly perceived world such as the permanence of objects, their motion, and "constancy" of size, shape, and brightness, and to specify the perceptual structures and laws that account for these differences. Commenting on the perception of shape and motion, Julian Hochberg writes: "The sensations seem to become completely unobservable, and totally submerged in the overall organization of the perceived object."[13] It is this "submerged" character of sensations that should give pause to those who wish to say that we are always aware of how we are sensing, and consequently to those who support inferential processes.

We can probe more deeply the question at issue by asking whether a sense impression is itself a conceptual state. At what point in the perceptual process does one begin to respond thinkingly, and by means of concepts, to information from the body? Is it at the level of sensation, or at some higher level? The question cuts deeply, and crystallizes opposing theories in the philosophy of mind. Ultimately, our judgment about inferences depends on the answer we give to this question.

We can perhaps throw some light on this difficult issue by suggesting what seems to be a natural way of grouping the relevant terms. We note, first, that at the level of sense experience one does not represent things as being outside of one's body in physical space. What is sensed does not include what Gustav Bergmann calls "the idea of external existence."[14] Further, it seems reasonable to take this absence of externality as a sign that the subject has not begun to conceptualize a world. We therefore propose that we should speak of a subject's conceptual activity only at the level at which he begins to represent physical objects standing over and against his own physical being. More simply, we should speak of a subject's conceptual activity only when he begins to *perceive* the world, for perception is essentially a state or condition in which a subject of experience represents, and gains knowledge of, physical things. This proposal has the effect of reinforcing

the distinction between nonconceptual sensations and conceptual perceptions, and if it has any basis in our understanding of these concepts, as I think it does, then it provides additional support for the central thesis of direct realism that sensations are not themselves thoughts that function as premises of inferences.

V. Conclusions

The aim of this paper has been to clarify and defend the central insight of direct realism that normal perceptions of physical things are noninferential in the sense that they are not the product of inferences from antecedent sensory states. Three lines of argument, opposed to direct realism, and in favor of perceptual inferences, were considered and found wanting. First, a consideration of the requirements of *perceptual knowledge* revealed that perceptual beliefs are indeed based on evidence, but this fact does not commit us to a theory of perception as an "inference to the best total explanation" as Gilbert Harmon argues. The fact that we have and can give evidence for these beliefs does not imply that we have used this evidence in a process of inference. Second, a careful examination of the explanation given by cognitive psychologists of the familiar Muller-Lyer illusion led to the conclusion that cases of this sort give evidence for saying that many ordinary perceptions are the result of inferences from minimal perceptions, although not from sensory states. Finally, those opponents of direct realism who accept the thesis that normal perceptions are inferences based upon antecedent sense impressions must also accept the thesis that we are normally cognitively aware of these sense impressions. However, consideration of a paradigmatic case in which there was seen to be a major discrepancy between the sensory state and its consequent perception made it implausible to think that sense impressions are usually accessible to introspective awareness. Hence the mental processes by which we pass from what is sensed to what is perceived should not be viewed as inferential.[15]

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NOTES

1. "Considerations for a Logic for Naïve Realism," in *Studies in Perception: Interrelations in the History of Philosophy and Science*, P. Machamer and R. Turnbull, eds. (Columbus, 1978), p. 526.

2. "The Problem of Perception" in *Perceiving, Sensing, and Knowing*, R. Swartz, ed. (Garden City, 1965), p. 519.

3. *Thought* (Princeton, 1973), p. 174. Harmon's repeated use of the phrase "direct perceptual knowledge" is puzzling in light of the fact that he abandons the claim of direct realism that perceptual beliefs are noninferential.

4. *Thought*, p. 174.

5. *The Intelligent Eye* (New York, 1970), p. 92.

6. I am indebted to Joseph Camp for this perspicuous formulation of the relevant inference. For a similar inferential account of the moon illusion, see L. Kaufman and I. Rock, "The Moon Illusion," *Scientific American*, (1962), pp. 120-30, esp. p. 122.

7. Gregory, *op. cit.*, pp. 95-6.

8. See especially *Science and Metaphysics* (New York, 1968), ch. 1.

9. These properties of objects are the so-called "proper" and "common sensibles."

10. Here I depart from Sellars who denies that the sense impression "bodily or literally becomes a part of the resulting [perceptual state]...it can only guide 'from without' the unique conceptual activity which is representing of *this-suches* as subjects of perceptual judgment." *Science and Metaphysics*, p. 16. For a fuller description of sense impressions as *components* of perceptions, see my paper "Bergman on Perceiving, Sensing, and Appearing," in *American Philosophical Quarterly*, (1974), pp. 109-12.

11. Sellars, *op. cit.*, pp. 9-16. R. Chisholm, *Theory of Knowledge* (Englewood Cliffs, 1977, 1966), pp. 20-2, 26-33, where Chisholm takes sensing or "being appeared to" to be a "self-presenting" state which is defined in such a way that if one is being appeared to in some way, then that fact is then evident to him.

12. Cited in E. H. Gombrich, *Art and Illusion* (Princeton, 1969), p. 226.

13. *Perception* (Englewood Cliffs, 1964), p. 58.

14. "Realistic Postscript," in *Logic and Reality* (Madison, 1964), p. 325.

15. I wish to thank Wilfrid Sellars and Joseph Camp for their extensive comments on an earlier draft of this paper, and for their clear and penetrating ideas about inferences that helped me in reaching my own.